OBJECTIVES: To determine recurrent (infective) exacerbations (AECOPD) and health care utilization among patients with moderate to very severe COPD. **METHODS:** Data for this study was obtained from the PHARMO Record Linkage System (RLS), which includes drug dispensing records from pharmacies, hospitalization records and detailed information from general practitioners. Patients with moderate to very severe COPD (GOLD II-III-IV) and a moderate or severe AECOPD between 2000 and 2010 were included in the study. Moderate and severe AECOPD were defined by drug use and hospitalizations respectively. Date of first AECOPD after first GOLD classification-test was defined as cohort entry. Study patients were followed from cohort entry to end of registration in PHARMO RLS, death, or end of study period, whichever occurred first. During follow-up, all recurrent AECOPDs were counted and characterized by type of AECOPD and health care utilization. **RESULTS:** Of 886 patients included in the study, 56% was male and mean (±SD) age was 66 (±11) years. The proportion of patients with GOLD II, III and IV was 52%, 34% and 14% respectively. At cohort entry, 747 patients (84%) had a moderate AECOPD and 139 (16%) had a severe AECOPD. The overall exacerbation recurrence rate per person year (PY) was 0.9. When stratifying by GOLD stage at cohort entry, this rate increased from 0.6 for patients with GOLD II to 1.1 for GOLD III patients and 1.3 for GOLD IV patients. The rate of severe exacerbations was 0.1 for patients with GOLD II and III and 0.2 for patients with GOLD IV. Mean hospital stay for severe exacerbations was 12 (±11) days and 75% were infectious. Moderate exacerbations were mostly treated with tetracyclines (46%), followed by penicillins (34%). **CONCLUSIONS:** This study provides a comprehensive overview of recurrent AECOPD among patients with moderate to very severe COPD, but also emphasizes the need for more research in infective AECOPD.

PRS9

ALLERGIES: DISTRIBUTION AND PERCEPTION IN THE GERMAN GENERAL POPULATION

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OBJECTIVES: To obtain population based data on the prevalence of allergies and to provide insight into allergy care and perceptions. **METHODS:** A random representative sample of the German population (>18 years) was recruited for a telephone survey in 2012. Descriptive data were stratified by criteria relevant for health-service research as age, sex, geographical region insurance status. **RESULTS:** For 51% of the n=1.004 respondents the topic "allergy" was personally relevant. One third of all respondents (33%) rated a physician-diagnosed allergy. Prevalence was higher in women (39%) than in men (27%) and in persons with higher educational level (39% vs. 33% lowest level). The most common allergen (43%) was pollen; 15% reported to have contact dermatitis (women 21%, men 5%). The majority of allergic persons (53%) felt (highly) burdened and 48% were limited in their daily activities due to symptoms. 70% have ever seen a physician or other therapist for their allergy (East: 62%, West 72%); GPs (45%) and dermatologists (41%) were consulted mainly. Self-medication was frequent among allergic persons (58%); it was most prevalent in the highest income and education groups as well as in West Germany. Medical treatment of acute symptoms was reported by 21% of the respondents. Regarding allergy perception, 39% appraised allergies as "easily treatable"; this opinion was more prevalent in women and in privately insured persons. In an open question on potential allergy triggers environmental factors were mentioned most often (26%), chemical agents. **CONCLUSIONS:** About one-third of the German general adult population is affected by allergies and constricted by acute symptoms. There is evidence for need of improvement concerning awareness and appraisal of allergies - which are not distributed evenly over social groups. In particular, there is a gap of using adequate medical treatment of acute symptoms.

PRS10

AN ANALYSIS OF REPORTED PNEUMONIA DEATHS IN MALAYSIA

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OBJECTIVES: It is estimated that there are 25 million cases of pneumonia worldwide with 63,500 deaths from the disease annually. *Streptococcus pneumoniae (S.pneumonia)* is one of the main pathogens that cause pneumonia. Apart from *S.pneumonia*, some other common pathogens include *Haemophilus influenzae*, *Staphylococcus aureus* and *Klebsiella pneumoniae*. However, pneumonia data from South East Asia is lacking. According to the Department of Statistics Malaysia, pneumonia is one of the top five causes of death in Malaysia. This study sought to describe pneumonia mortality in Malaysia using death statistics from the Department of Statistics Malaysia. **METHODS:** This study used death data from 2004 to 2008 obtained from Department of Statistics Malaysia. For the purpose of analysis, medically certified deaths that were due to pneumonia were analysed by age group. Pneumonia death rate was calculated against the population age cohorts for each year. Rates were reported in deaths per 100,000 population. **RESULTS:** The average crude mortality rate in Malaysia for the period 2004 to 2008 ranged from 440.4 to 454.0 per 100,000 population. However, deaths attributed to pneumonia showed an increasing trend from 11.9 (2004), 12.9 (2005), 13.8 (2006), 15.6 (2007) and 19.3 (2008) per 100,000 population. **CONCLUSIONS:** Deaths due to pneumonia over the period 2004 to 2008 have shown an increase even though the crude death rate has been stable during that time. Further analysis to determine pathogens and aetiology of the pneumonia deaths is warranted.

PRS11

THE SHORT-TERM ECONOMIC IMPACT OF THREE CHILDHOOD PREVENTIVE HEALTH PROGRAMS IN ISRAEL

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OBJECTIVES: To estimated the budget impacts of immunization against pneumococcal disease (PD) and human papillomavirus (HPV), and of prophylaxis against severe respiratory syncytial virus (RSV) disease, in Israel. **METHODS:** Incidence-based models compared the annual budget impact, from the Israeli health care system perspective, of the PD and RSV programs. Because HPV disease is slow developing, cumulative five-year disease costs were instead modelled for this program. Model inputs were from published literature. Outputs included total program cost, disease costs and disease cost offsets, in 2012 Israeli New Shekels (NIS). **RESULTS:** A 13-valent pneumococcal conjugate vaccine (PCV13) vaccination program, covering 175,428 infants, prevented approximately 78 cases of invasive disease, 218 of pneumococcal pneumonia and 225 of pneumococcal otitis media. Immunization against HPV in a year's cohort of 66,185 twelve-year old girls prevented approximately 321 cases of cervical intraepithelial neoplasia and 48 cases of genital warts over five years. RSV prophylaxis in 2,266 high-risk infants prevented approximately 138 hospitalizations for severe RSV disease. Total disease costs in year one of the model, without the programs, were 7,250,461 NIS (PD) and 17,988,932 (RSV infection); cumulative five-year disease costs in the HPV model without immunization were 1,331,194 NIS. Total disease costs, with the programs (excluding the cost of prophylaxis) were 3,305,522 NIS (PD) and 14,426,876 NIS (RSV disease), for annual savings of 3,944,939 NIS and 3,562,056 NIS, respectively. HPV disease costs over five years with the program were 535,480 NIS, saving an estimated 795,713 NIS over five years. The immunization programs cost: 133,135,790 NIS (PD), 35,106,399 NIS (HPV) and 34,888,624 NIS (RSV disease). **CONCLUSIONS:** All programs had substantial acquisition costs, but annual net savings, when the costs of the program were excluded. Even programs considered expensive are well-positioned financially within the context of other childhood preventive health strategies, when targeted to appropriate populations.

PRS13

VARIATION OF COST OF CHRONIC OBSTRUCTIVE LUNG DISEASE IN ADULTS IN GERMANY: A SYSTEMATIC REVIEW

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OBJECTIVES: A significant economic burden for society is linked to chronic obstructive lung diseases because of their high and still growing epidemiologic impact worldwide. The purpose of this systematic review is to estimate the cost-of-illness per case for the two most important obstructive lung diseases, asthma and COPD, for adults in Germany. **METHODS:** A systematic search of Pubmed, Embase, EconLit and Business Source Complete was performed for the years 1995 to 2012 in order to identify German cost-of-illness studies for asthma and COPD. Studies identified were analysed according to methods used, and cost findings were inflated to 2010 prices and compared within the same disease. **RESULTS:** Six studies for asthma, seven for COPD and one for both diseases met the inclusion criteria. The costs for asthma differ widely, ranging from minimum to maximum by a factor of 6.7 for direct costs and 9.6 for indirect costs per case. For COPD, costs per case ranged by a factor of 4.2 for direct costs and of 6.5 for indirect costs. In spite of the heterogeneity in methodology and results, medication could be identified as the most important single component of direct costs, and work loss as the most important component of indirect costs. All in all, the estimated costs per case of illness and year varied by a factor of 5.7 with a maximum slightly above 2,500 € for asthma and by a factor of 2.9 with a maximum of almost 3,500 € for COPD. **CONCLUSIONS:** Findings confirm that asthma and COPD are costly but results vary markedly. COPD causes both higher costs per case and higher total costs as a result of its higher prevalence. Results emphasize the economic relevance of effective prevention and disease management for these chronic obstructive lung diseases.

PRS14

CLINICAL AND PHARMACOECONOMIC ASPECTS OF ALLERGEN IMMUNOTHERAPY IN THE SLOVAK REPUBLIC

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OBJECTIVES: To evaluate direct costs of allergen immunotherapy with regard to its clinical benefit in the treatment of allergic rhinitis in the Slovak Republic. **METHODS:** In co-operation with the General Health Insurance Company, the largest insurer in Slovakia covering approximately 66% of all patients, the clinical benefits were analyzed with respect to direct medical costs (cost of illness), costs minimization and prevention of onset of asthma bronchiale (AB), in a short- and a long-term period. The outcomes were obtained from an analysis of a group of 109,974 patients who were newly diagnosed with allergic rhinitis (AR) in 2002 and were followed up until the end of 2010. In 2010, allergic rhinitis was detected in only 14,742 of these patients. **RESULTS:** The prevalence of AR and AB was 9.34% and 4.74%, respectively. In 2010, the total direct costs of AR and AB in Slovakia were approx. 37,946,000 € and 51,512,000 €, respectively. Direct medical costs of AR and AB treatment in 2010 in the evaluated group were 50.14 € and 198.03 €, respectively. Allergen immunotherapy decreases average annual costs of pharmacotherapy of AR by 17 € per patient and annual costs of prevention of onset of AB by 164.89 € per

patient. Compared to symptomatic therapy, patient with AR treated with allergen immunotherapy obtained approx. 0.75 month (3 years of vaccination followed by 5-year evaluation) and 3.45 month (4-year follow up including 3 years of vaccination) without AB. The QALY for costs has been calculated between 8516 € - 8883 €. **CONCLUSIONS:** In the Slovak Republic, Staloral allergen immunotherapy of allergic rhinitis is effective from the clinical as well as pharmacoeconomic point of view.

PRS15

THE ECONOMIC IMPACT OF COPD IN PATIENTS OF WORKING AGE: RESULTS FROM 'COPD UNCOVERED' THE NETHERLANDS

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OBJECTIVES: Chronic Obstructive Pulmonary Disease (COPD) poses a significant burden on health care budgets. The impact of impaired and lost productivity is less known. The aim of this study was to explore the economic burden of COPD in patients of working age in The Netherlands across three areas: health care utilization, impaired productivity and lost productivity resulting from early retirement due to COPD. **METHODS:** Dutch direct medical costs were derived from a literature review and applied to individual COPD patients. Costs of productivity impairment due to COPD were estimated from the 'COPD uncovered' survey, adopted for The Netherlands. Costs due to lost productivity due to early retirement were based on a cohort of COPD patients of working age followed in a Markov model for 20 years until (early) retirement or death. The costing year was 2011. **RESULTS:** The annual health care costs for patients with COPD aged 45-64 years in The Netherlands were estimated at around €70 million. The annual impaired productivity costs were €120 million. Lost productivity due to early retirement were estimated at around €510 million per year; the majority of €350 million for men and €160 million for women. These lost productivity costs represented 21% of the productivity that may have been generated by COPD patients if they had not retired early. **CONCLUSIONS:** The 'COPD UNCOVERED' model was used to estimate the economic burden of COPD in The Netherlands. Costs due to impaired and lost productivity in COPD patients of working age was considerable and several times higher than the medical cost of COPD. Young working population provide a main target for interventions aimed to improve COPD disease management.

PRS16

SOCIOECONOMIC BURDEN OF COPD IN UKRAINE: 2012-2020 PERSPECTIVE MODELING

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OBJECTIVES: According to the GOLD report (2011), COPD is associated with significant economic burden. For Ukraine as for developing country, the human capital (employed economically active population) is the most important national asset and COPD-related work-place loss may represent a serious threat for Ukrainian economics. **METHODS:** Via the best fit (least square) linear regression forecast we modeled the 2012-2020 dynamics of the key socioeconomic and COPD-related epidemiological indicators for general Ukrainian population and employed economically active population. Modeling was based on the 2005-2011 reports of the Ukrainian National Center of Statistics and data from WHO. Using forecasting results the number of new COPD cases and COPD-related deaths 2012-2020 was calculated. Also we calculated and compared 2012 and 2020 direct and indirect costs. **RESULTS:** According to the forecasting results, number of total Ukrainian population and employed economically active population could amount 45453100 and 20393267, respectively, in 2012 and 43484907 and 20845448, respectively, in 2020. Number of COPD patients in 2012 and 2020 could be 1766748 and 1731332, respectively, in general population and 792680 and 829952, respectively, in employed economically active population. Number of 2012-2020 new COPD cases and COPD related deaths could be 1230750 and 56207, respectively, in general population and 570737 and 25892, respectively, in employed economically active population. We estimated that in 2012 direct COPD costs could be 87,17% greater than indirect COPD costs and could amount to €326367598 vs. €193607579,9, respectively. In 2020 indirect COPD costs could 1,47% exceed the direct costs and could amount €496997427,8 vs. 489796409, respectively. **CONCLUSIONS:** Results of modeling show that socioeconomic burden of COPD will be significant for Ukraine during the 2012-2020 periods. COPD costs will rise with the significant growth of indirect costs, which may be typically for Ukraine as for developing country.

PRS17

AVAILABILITY, AFFORDABILITY AND PRICE OF ASTHMA MEDICINES IN TEHRAN; IRAN

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OBJECTIVES: Asthma, a major chronic respiratory disease, has become a cause of global concern in terms of its increasing prevalence, morbidity and economic impact.Our aim was to examine the availability, pricing and affordability of asthma medicines in Tehran. **METHODS:** The study methodology was designed using the recommendations developed by the World Health Organization and Health Action International on measuring medicine prices, availability, affordability and price components. Data was collected from 5 public sector facilities and 10 private sector retail pharmacies in the pilot study in 22 regions of Tehran.Data on price of innovator brands (IBs) and lowest priced generics (LPGs) found at each facility were gathered and applied for data analtysis. **RESULTS:** Generic beclomethasone was found in 3 public sectors and generic salbutamol was available in 4 public sectors.The availability of IB beclomethasone was poor in all of the regions surveyed .IB beclomethasone was available at 2 out of 5 and 5 out of 10 pharmacies surveyed in public and private sectors, respectively. The availability of generic beclomethasone inhalers was 90%. IB salbutamol inhalers were available in all the surveyed regions.At the time of the survey, the lowest paid unskilled government worker earned 108 400 Iranian Rials (IRR) (US$ 11.78) per day. **CONCLUSIONS:** The poor availability of inhalers at public facilities affects those patients who depend on these facilities for treatment and medications. In the past decade, some barriers were imposed by the Ministry of Health on registering certain pharmaceuticals . A new approach has focused on reducing these barriers and there is a need for stronger government action to introduce or improve national medicine policy as well as effective pricing policies.

PRS18

SYSTEMATIC REVIEW OF ECONOMIC EVALUATIONS, UTILITY ESTIMATES, RESOURCE UTILISATION, AND COSTS IN CHRONIC IDIOPATHIC URTICARIA

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OBJECTIVES: To systematically identify economic evaluations of treatments recommended for chronic idiopathic urticaria (CIU) and studies reporting health-state utility weights and/or estimates of resource use and costs. **METHODS:** Systematic searches of MEDLINE, MEDLINE-In-Process, EconLit, EMBASE, the Cochrane Library, and conference abstracts were conducted from 1 January 2000 to 20 December 2011. Inclusion criteria considered studies reporting utility weights, resource use, costs, and/or economic evaluations of treatments in CIU patients older than 12 years. **RESULTS:** From 266 retrieved records, 3 studies were included: 1 economic evaluation of levocetirizine and 2 cost studies. The economic evaluation was a pooled analysis of two clinical trials comparing levocetirizine with placebo and incorporating productivity losses defined as absenteeism and/or presenteeism. One cost study reported total annual per-patient direct costs of $1,762; the other study reported a cost range between $1,290 and $2,419, depending on disease severity. Cost components included prescriptions, visits, hospitalisations, and laboratory costs. Annual per-patient indirect costs, defined as disease-related loss of earnings, were between $213 and $484, depending on severity. Although no utility studies in CIU were found, one study demonstrated that CIU severely impairs health-related quality of life at the same level as skin conditions, such as psoriasis and atopic dermatitis, on certain dimensions. **CONCLUSIONS:** This review identified limited evidence on costs, only one economic evaluation, and no utility data for CIU. Lacking comparative data, it is impossible to conclude what the most cost-effective treatment in CIU might be. Due to discrepancies between the cost studies, it is difficult to conclude which cost component contributed the most; however, one study reported that productivity loss was a major component. This review highlighted the substantial cost burden and a humanistic burden, comparable to other skin disorders, of CIU. Further research in this area is needed.

PRS19

COST-BENEFIT ANALYSIS OF TIOTROPIUM AND SALMETEROL TREATMENT COMPARE TO USUAL PRACTICE ON SAMPLE OF EMPLOYED ECONOMICALY ACTIVE COPD PATIENTS IN UKRAINE

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OBJECTIVES: According to the GOLD report (2011) COPD is associated with significant economic burden. COPD exacerbations account for the greatest proportion of the total COPD costs. Frequency and severity of COPD exacerbation could be reduced by the appropriate medication that could be reimbursed by Ukrainian Government. **METHODS:** To determine the net benefit ratio we assessed total COPD costs and the COPD exacerbation-related costs reduction as benefit (effectiveness) for tiotropium (18 mcg daily) and salmeterol (50 mcg two times a day) compared to usual COPD treatment practice of GPs. Direct costs included medication costs, outpatient and inpatient costs. Indirect costs included productivity loss and temporary disability related payments. Calculations were performed per 1000 employed economically active COPD patients. The data about the outpatient visits and hospitalizations was received from results of Ukrainian retrospective study (for usual practice regimen) and from the POET study results (for tiotropium and salmeterol). Prices for medical services were received from appropriate survey (2011) and were counted with May 2011-May 2012 inflation index and salary growth rates. The minimal market medication prices (on 15 June 2012) were included in calculations. Sensitivity analysis was conducted with medication price decrease. **RESULTS:** Results show that total COPD costs per 1000 employed economically active COPD patients in 2012 could amount €498052,34, €441697,07 and €508983,73 with usual COPD treatment practice of GPs, salmeterol and tiotropium, respectively. Reduction of exacerbation-related COPD costs compared to usual practice could amount €85698,78 for salmeterol and €114380,78 for tiotropium. Cost benefit ratio for salmeterol could be 5,15 and for tiotropium could be 4,45. In case of 27% price drop salmeterol could be more beneficial than tiotropium. **CONCLUSIONS:** According to results of the cost-benefit analysis tiotropium is more beneficial for COPD basis in employed economically active Ukrainian population than salmeterol compared to usual practice. It could be reimbursed by Ukrainian government.

PRS20

COST-BENEFIT ANALYSIS FOR A TREATMENT OF PULMONARY ARTERIAL HYPERTENSION

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